

**ABSTRACT**

Provided are a stainless steel for a proton-exchange membrane fuel cell separator having high durability and a low contact resistance (i.e., high electrical conductivity) and a proton-exchange membrane fuel cell using the same. More specifically, a stainless steel for a proton-exchange membrane fuel cell separator has a composition comprising 0.03% mass % or less of C, 16-45 mass % of Cr, 0.03 mass % or less of N, 0.1-5.0 mass % of Mo, wherein a total of the C content and the N content satisfies 0.03 mass % or less; a balance portion is comprised of Fe and unavoidable impurities; an atomic ratio of Cr/Fe with respect to Al, Cr, and Fe contained in a passive film on a surface of the stainless steel is 1 or greater.

(Selected Drawing) FIG. 2